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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,346	11/20/2003	George A. Pavlath	NGC-153/000060-199	1241

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EXAMINER	
CHIEM, DINH D	

ART UNIT	PAPER NUMBER
2883	

DATE MAILED: 07/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/718,346	PAVLATH, GEORGE A.	
	Examiner	Art Unit	
	Erin D. Chiem EDC	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☒ Claim(s) *11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the amendment filed on April 10, 2006. Claims 1-25 are pending.

Claim Objections

Claim 11 is objected to because of the following informalities: the amended recitation would be more appropriate if recited as "wherein the optical component comprises a first optical component and a second optical component." Currently, the recitation of "a second optical component" has no correlation to the "optical component." Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vengsarkar (US 5,430,817) in view of Orthonos et al. (Artech House, Inc., 1999) and in further view of Huang et al. (US 4,231,465) and Michal et al. (US 6,108,086), and in further view of Ales et al. (US 6,507,429 B1).

Regarding claims 1, 5-12, 14, 16-25 Vengsarkar discloses an apparatus comprising a light source (col. 4, line 54), a first long period grating (Fig. 5, 57) optically coupled with the light source; and an amplification fiber (54) that is optically coupled with the long period grating; wherein the light source send one or more pump optical signals (56) to the long period grating; wherein the long period grating transmits the one or more pump optical signals to the amplification fiber; wherein the amplification fibers absorbs a subset of the one or more pump optical signals and emits one or more output signals; where in the long period gratings attenuates the one ore more output signals. Long period gratings are well known, will be proven in the subsequent sources, to attenuate (or also known as loss, SearchNetworking.com) for it was designed to discriminate by rejecting desired wavelengths dependent on apparatus building specifications. Instead of reflecting the rejected wavelength like Bragg gratings, long period Bragg gratings couple the rejected wavelength to the cladding. Hence, the pump signals sent through by element 56 into the long period grating 57 is pumped at a range of wavelengths and the output wavelength sent from long period grating 58 is without a range of wavelength, or can also be interpreted as "substantially same second wavelength" relative to the signal sent from long period grating 57 "substantially first wavelength." As closely disclosed by Vengsarkar 1 in how to space the gratings in such a way that the gain flattening or more well known as attenuation can be more uniform over a range of wavelengths of 1530 – 1560 (col. 3 line 65 -

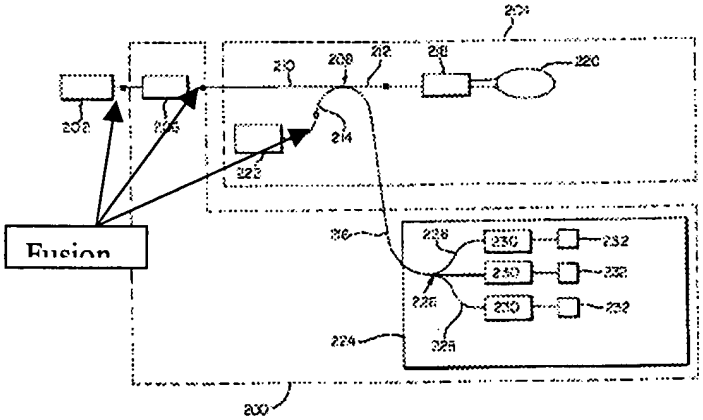
col. 4, line 14). Furthermore, the limitations regarding reducing or promoting decrease in backreflections and the limitations regarding the residual signals from the gratings are merely characteristics of the long period Bragg gratings.

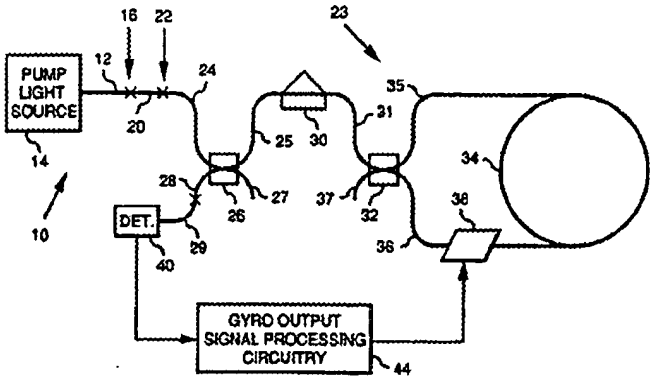
However, Vengsarkar does not explicitly disclose a long period Bragg grating nor does Vengsarkar explicitly disclose a long period Bragg grating that is optically coupled with the light source via a first optical splice; and an amplification fiber that is optically coupled with the long period Bragg grating via a second optical splice.

Orthonos et al. teach in the fundamental theories of Bragg gratings that long period gratings are a species of Bragg gratings. Orthonos cross referenced to Vengsarkar 2 as the scientist who found the characteristics of the long period gratings can be applied as low-loss band-rejection filters. The periodicity of the long period grating is chosen to couple light from the guided single mode LP_{01} of the fiber into the forward propagating cladding modes, where it is lost due to absorption, such as erbium doped amplification fibers, and scattering. The phase-matching condition that determines the exact periodicity of the grating; for two forward-propagating modes (i.e., first wavelength and second wavelength) dictates that the period of the Bragg grating must be long or longer than the transmitting wavelength. Such forward propagating coupling is key to the sought after characteristic of low backreflection in long-period Bragg grating (Orthonos, pp. 142 – 143).

Michael et al. discloses a scale factor stabilizing system comprising of a primary pass (206) filter that is optically coupled to the light source (202) at the first fusion splice (the first dot), an amplification fiber that is optically coupled with the primary pass filter at the second optical splice (second dot). Furthermore, Huang et al. is incorporated by reference (col. 4, lines

59-65) specifically teaches fusion splicing for the purpose of reducing coupling loss (see Huang et al. in full) and the dots in Michal's reference corresponds to the x's in Huang's reference. Furthermore, Michal specifically discloses in claim 11 that the primary bandpass filter comprises and optical fiber situated between two fiber optic gratings, each of the gratings having a different periodicity so as to allow only wavelengths of light in a bandwidth between the periodicity of the gratings to propagate while attenuating all other wavelengths of light outside of this bandwidth.





Vengsarkar, Orthonos, Michal, and Huang are all from the same field of endeavor.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to:

1) Understand through the disclosure of Vengsarkar that the "long period spectral shaping device" is an alternative lexicography for the conventionally known long period Bragg grating, that the inventor was credited for the research of using long period Bragg grating as a low loss band rejection filter.

2) Recognize in a measuring system which employs a broadband light source, a pump laser diode, Erbium doped amplification fibers, long period Bragg gratings, and other optical components such as photodetectors and optical gyroscope that it would have been obvious to employ splices indicated by Michal et al. in Fig. 5, through the incorporated reference of Huang, discloses in detail the fusion splices of the entire system for the purpose of reducing coupling loss.

3) It is clearly obvious at the time the invention was made to a person having ordinary skill in the art to use the long period bandpass filter. Michal teaches using high-pass and low-pass filter which results in the narrowband output and Vengsarkar spectral shaping device is used for the purpose of low loss band pass filter, thus one having ordinary skill in the art would be able to apply the teaching of Vengsarkar's filter and implement the filter in Michal's scale factor stabilization system where band pass filter is required. Vengsarkar taught that **the motivation** for employing is that long period bandpass filter is less susceptible to ionization radiation to stabilize the centroid wavelength for providing more correct linearization scale factor such that the rotation of the gyroscope and phase information of the optical signal may be correlated to extract parameters of interest. Such measuring instrument is most beneficial in harsh and

radiation environment. Furthermore, Ales et al. provides the motivation for incorporating the teaching of a long period Bragg grating of Vengsarkar into the sensing system with a gyroscope to providing a "smoother[er]...output" (col. 3, lines 56-64). **The motivation** for employing fusion splicing rather than mechanical splicing is for the economical value of fusion splicing and fusion splices require extraneous splicing components such as V-shaped metal clamps, see non-patent literature "Lennie Lightwave's Guide to Fiber Optics: Termination and Splicing" for more comparative details. Another **motivation** for using fusion splicing is the low loss coupling ability that fusion splicing provides to the system. And most importantly, fusion splicing doubly cladded fibers is to remove residual pump/residual light in the cladding.

As to claim 2, Vengsarkar in view of Orthonos, Michal, and Huang discloses the apparatus as described above.

Michal discloses the first wavelength and the second wavelength comprise different wavelengths (claim 11).

As to claim 3, Vengsarkar in view of Orthonos, Michal, and Huang discloses the apparatus as described above.

Vengsarkar discloses the range of wavelength attenuations comprising the sub-ranges (Fig. 3).

As to claim 4, Vengsarkar in view of Orthonos, Michal, and Huang discloses the apparatus as described above.

Michal and Huang disclose the first, second, and third optical splices in Fig. 4 of Michal.

As to claim 13, Vengsarkar in view of Orthonos, Michal, and Huang discloses the apparatus as described above.

Michal discloses a multi-function integrated optic chip (Fig. 4, '218').

As to claim 15, Vengsarkar in view of Orthonos, Michal, and Huang discloses the apparatus as described above.

Michal discloses the light source is a pump laser diode (col. 1, line 22).

As to claims 20-23, in disclosing the apparatus that reduces backreflection of an output signal from gyroscope broadband fiber system, Vengsarkar in view of Orthonos, Michal, and Huang discloses the "promoting" steps as claimed.

Response to Arguments

Applicant's arguments filed April 10, 2006 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

The new limitation of independent claim 1 is not described or suggested by the cited prior art.

Examiner's responses to Applicant's ONLY arguments are as follows:

It is respectfully pointed out that the Applicant defined the "forward pumped broadband fiber source configuration" to be a configuration that "the light source sends the pump light directly to the rare-earth doped fiber. The forward pumped broadband fiber source omits the wave division multiplexing fiber of the design of the backwards pumped broadband fiber source" (Background). Vengsarkar clearly teaches his invention away from one that has a wavelength division multiplexed system because Vengsarkar noted that erbium doped fiber amplifier emits different gains for different channels which would lead to high bit error rates in some of the channels, and Vengsarkar's spectral shaping device would help flatten the gain spectrum of the amplifier, as consistent to Ales disclosed motivation; see Vengsarkar col. 1, lines 49-57.

Furthermore, the application of Michal's reference is to supply the deficiency regarding how one in the art would provide scale factor shift stabilization in a gyroscope system. However, the incorporation of Ales reference should be clear that the long period Bragg grating is known in the application of a gyroscope system for flattening the output signal.

Applicant's disclaimer on page 12 recites "[t]his discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the Office Actions citations to Vengsarkar, Orthonos, Goldberg, or Michael correspond to the claimed invention" is noted. However, it is respectfully pointed out that since Applicant did not argue any other dependent claims rejection in the Remarks filed on April 10, 2006, then any argument that is made in regard

to the dependent claims that is subsequent to this Final Rejection, such as an After Final Amendment, those argument(s) would be considered untimely.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin D. Chiem whose telephone number is (571) 272-3102. The examiner can normally be reached on Monday - Thursday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Examiner
Art Unit 2883

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